

## **Sources of Variability in Water Quality Monitoring Data**

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### **Abstract**

The objective of many water quality monitoring programs is to detect changes in water quality (a trend) amidst the other sources of variability (noise) in the data. The ability to detect trends in water quality is directly related to the magnitude of the variability of the data. Sources of variability include: natural in-stream variability, variability due to sample collection and field processing, and variability due to laboratory analysis of the water. Using data from the Puget Sound Ambient Monitoring Program's Freshwater Monitoring Network (collected by the Department of Ecology) this paper estimates the variability of several variables due to these three sources and discusses the importance of each relative to trend analysis.